

## ABSTRACT OF THE DISCLOSURE

Optical interconnect layers and methods of fabrication thereof are described. In addition, the optical interconnect layers integrated into devices such as backplane (BP), printed wiring board (PWB), and multi-chip module (MCM) level devices are described. A representative optical interconnect layer includes a first cladding layer, a second cladding layer, one or more waveguides having a waveguide core and an air-gap cladding layer engaging a portion of waveguide core, wherein the first cladding layer and the second cladding layer engage the waveguide.